

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
9 September 2005 (09.09.2005)

PCT

(10) International Publication Number
WO 2005/083629 A1

(51) International Patent Classification⁷: **G06T 7/00**

(21) International Application Number:
PCT/IB2005/050468

(22) International Filing Date: 4 February 2005 (04.02.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
04100689.1 20 February 2004 (20.02.2004) EP

(71) Applicant (for DE only): **PHILIPS INTELLECTUAL PROPERTY & STANDARDS GMBH** [DE/DE]; Stein-
damm 94, 20099 Hamburg (DE).

(71) Applicant (for AE, AG, AL, AM, AT, AU, AZ, BA, BB, BE, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CY, CZ, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, SZ, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW only): **KONINKLIJKE PHILIPS ELECTRONICS N. V.** [NL/NL]; Groenewoud-
seweg 1, NL-5621 BA Eindhoven (NL).

(72) Inventors; and

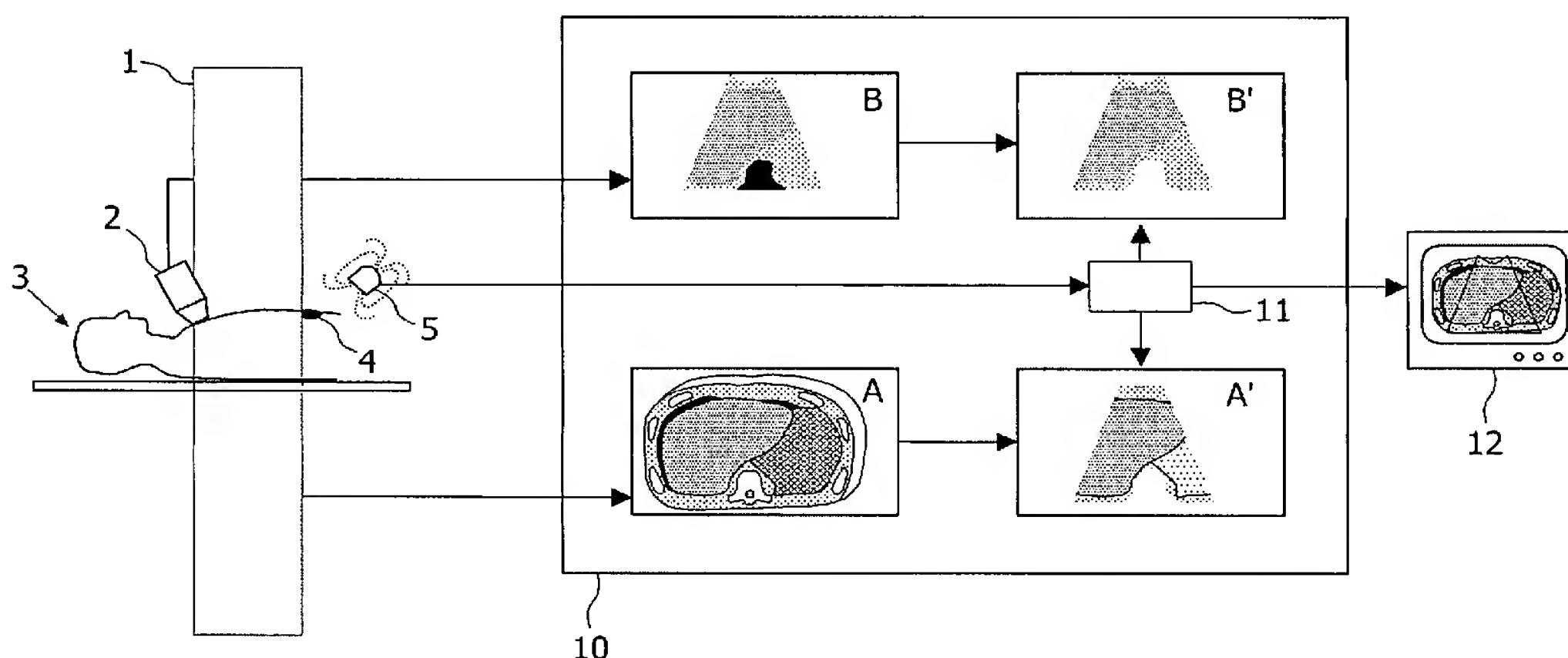
(75) Inventors/Applicants (for US only): **MEETZ, Kirsten** [DE/DE]; c/o Philips Intellectual Property &, Standards GmbH Weissshausstr. 2, 52066 Aachen (DE). **SCHULZ, Heinrich** [DE/DE]; c/o Philips Intellectual Property &, Standards GmbH Weissshausstr. 2, 52066 Aachen (DE). **VON BERG, Jens** [DE/DE]; c/o Philips Intellectual Property &, Standards GmbH Weissshausstr. 2, 52066 Aachen (DE). **SABCZYNSKI, Joerg** [DE/DE]; c/o Philips Intellectual Property &, Standards GmbH Weissshausstr. 2, 52066 Aachen (DE).

(74) Agents: **VOLMER, Georg** et al.; Philips Intellectual Property &, Standards GmbH Weissshausstr. 2, 52066 Aachen (DE).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

[Continued on next page]

(54) Title: DEVICE AND PROCESS FOR MULTIMODAL REGISTRATION OF IMAGES



(57) Abstract: The invention relates to a device and a process, with which images of different imaging methods can be registered, for example preoperatively obtained 3D X-ray images (A) and intra operatively obtained ultrasound images (B). First transformed images (A',B') are then generated in a data processing device (10), which are aligned to each other with regard to the peculiarities of each imaging method. Particularly from the three dimensional CT-image (A), can be generated a two dimensional image (A') which adheres to the characteristic means of representation of an ultrasound system, while shaded areas behind bones and/or gas-filled volumes can be blended out. With a feature-based registration of the transformed images (A', B') errors are avoided, which are traced back to artifacts and peculiarities of the respective imaging methods.

WO 2005/083629 A1



(84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *with international search report*